

## **FIVE MYTHS ABOUT YUCCA MOUNTAIN**

**By Isaac J. Winograd**

In 2002, following an overwhelming bipartisan endorsement by Congress, the Bush Administration proceeded with its plans to utilize Yucca Mountain in southern Nevada as the Nation's first repository for spent nuclear fuel, the highly radioactive by-products of nuclear energy. In 2008, following procedures dictated by the Nuclear Waste Policy Act of 1982, the U.S. Department of Energy submitted a license application to the Nuclear Regulatory Commission for permission to construct the repository and the Commission staff began its review. However, in 2009, Dr. Stephen Chu, Secretary of Energy, declared Yucca Mountain to be "unworkable" and the Obama Administration withdrew all funding for ongoing work at the site. The Nuclear Regulatory Commission, in turn, was pressured by the Administration to halt its nearly complete evaluation of the license application. In response to suits filed by the States of Washington and South Carolina the U.S. Court of Appeals for the District of Columbia Circuit issued a writ of mandamus on August 13, 2013 requiring the Commission to complete its work on the license application. With this background, we examine five myths pertinent to the Yucca Mountain saga.

### **MYTH 1. The selection of Yucca Mountain was political from the beginning.**

This myth originates from the 1987 amendment to the 1982 Nuclear Waste Policy Act. The original Act required that three sites be studied in detail prior to selection of a site deemed suitable for construction of a repository. The 1987 Amendment bypassed this requirement and selected Yucca Mountain (one of the three finalists), earning the moniker among Nevadans as, "the screw Nevada bill." The fact that Yucca Mountain had been identified as a potential repository years earlier, solely on the strength of its technical attributes, was thus irrevocably lost on the public who rightly resented the change in site selection rules. Utilization of arid regions with deep water tables, such as the Mojave Desert of southern Nevada, for the disposal of spent nuclear fuel was first proposed in the geologic literature in 1974. By 1983,

four years prior to the 1987 action by Congress, this concept was endorsed for detailed study by geologists at the U.S. Geological Survey, Lawrence Berkeley National Laboratory, and shortly thereafter, specifically with respect to Yucca Mountain, by scientists at the Nuclear Regulatory Commission.

**Myth 2. Yucca Mountain was shelved based on its technical deficiencies.**

Senator Harry Reid, a decades-long opponent of Yucca Mountain and the driving force behind the Obama Administration's decision to shut it down, has deemed Yucca Mountain "technically and scientifically unsound." His assessment is unsupported by the scientific community. Between 1983 and 2007, hundreds of scientific and engineering reports were written and 7 miles of underground tunnels driven – at a cost of about 9 billion dollars – to determine the site's suitability as a repository for spent nuclear fuel. As a result of this work Yucca Mountain is one of the most thoroughly studied areas in the world with respect to its geology, hydrology, and paleoclimate. In August 2008, Dr. Stephen Chu, then Director of the Berkeley National Laboratory, and the Directors of the nine other National Laboratories jointly called for "licensing of the Yucca Mountain Repository as a long-term resource."

([http://www.ne.doe.gov/pdfFiles/rpt\\_SustainableEnergyFuture\\_Aug2008.pdf](http://www.ne.doe.gov/pdfFiles/rpt_SustainableEnergyFuture_Aug2008.pdf)). In June 2011, a panel of senior scientists and engineers, appointed by President Bush on the recommendation of the National Academy of Sciences, concluded that "The Yucca Mountain program developed considerable data, methodology, and evidence to indicate the technical feasibility of isolating high-activity waste in an unsaturated oxidizing environment" that is, in an arid environment with a deep water table (U.S. Nuclear Waste Technical Review Board, *Technical Advancements and Issues Associated with the Permanent Disposal of High-Activity Wastes: Lessons Learned from Yucca Mountain and Other Programs*, June 2011, p.69 ).

**Myth 3. Transport of spent nuclear fuel to Yucca Mountain is a “mobile Chernobyl” waiting to happen.** This statement is an effective canard designed to instill fear in the public. Unlike the hundreds of railroad tank cars carrying hazardous *gaseous* and *liquid chemicals* through our towns and cities every day, spent nuclear fuel is a *metallic* and *ceramic solid* which is to be transported in specially designed steel casks and railroad cars under armed guard. The National Academy of Sciences compared the risks of railroad transport of hazardous gases and flammable liquids to that of solidified spent nuclear fuel and concluded that “the likelihood of extreme accidents that would lead to fatalities is several orders of magnitude lower for spent fuel than for other hazardous materials...” that is, hundreds to over a thousand times less likely (*National Research Council, 2006, Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States; The National Academy Press, pp. 174-182*).

**MYTH 4. The local Nevada population objects to Yucca Mountain.** On March 6, 2012, the Commissioners of Nye County, where Yucca Mountain is located, wrote to Dr. Chu advising him that they “consent to host the proposed repository at Yucca Mountain consistent with our previous resolutions...” In so doing Nye County fulfilled a major recommendation of the Blue Ribbon Commission empanelled by Dr. Chu to provide guidelines for the siting of nuclear waste facilities; namely, obtaining the approval of the local population at a proposed repository site. Additionally, the Commissioners of five other rural Nevada counties (Esmeralda, Lander, Lincoln, Mineral and Churchill) have called for completion, by the Nuclear Regulatory Commission, of the Department of Energy’s license application for construction of the repository. In contrast, the residents of Las Vegas, 90 miles distant from Yucca Mountain, object to its utilization as a repository. They view it as potentially detrimental to tourism.

**Myth 5. No rush. A better solution and repository site will be found in the near future.** Since 1955, the consensus among geologists and other scientists from all countries with nuclear energy is that spent fuel should be buried deep underground within rocks that minimize the possibilities for transport of the long-lived radionuclides to the surface. No alternative to deep burial has emerged in the past 58 years. With regard to identification of a better site than Yucca Mountain, no site in any country has received more study and critique than Yucca Mountain. Despite this exhaustive examination over a period of over two decades it remains a viable, though hardly perfect site. Identification, initial public acceptance, comprehensive study (via drilling and mining), critical examination by multiple expert panels, and licensing of an alternative site will take at least this long with no guarantee that, after decades of work, the extant political leadership will endorse the site. In the interim, in the absence of even a centralized surface storage facility, more than 65,000 metric tons of spent fuel will remain in temporary storage at 72 nuclear power plants across the Nation as a legacy for our grandchildren.

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Isaac J. Winograd is a retired geologist. While employed by the U.S. Geological Survey his research, and that of fellow retiree Eugene H. Roseboom, Jr., identified Yucca Mountain as a potential repository for spent nuclear fuel. The views expressed herein are those of the author and not of the Geological Survey.